2021-02

A Unique Take on NPS: Important Then, Critical Today

Porter, Wayne

U.S. Naval Institute

Porter, Wayne. "A Unique Take on NPS: Important Then, Critical Today" Proceedings (US Naval Institute). Vol. 147/2/1,416, February 2021.
http://hdl.handle.net/10945/67888

A Unique Take on NPS: Important Then, Critical Today

Fifteen years ago, the Naval Postgraduate School (NPS) was spared from the Base Realignment and Closure Study for good reasons. The school is even more important and relevant to naval and national security today.

By Dr. Wayne Porter, Captain, U.S. Navy (Retired)
February 2021 | Proceedings | Vol. 147/2/1,416

In March 2005, Admiral Michael Mullen, then Commander, U.S. Naval Forces Europe and Commander, Allied Joint Force Command summoned me to his office. He had learned I had two master's degrees from the Naval Postgraduate School, and he had a special project for me. "I want you to write a paper I can give CNO [Chief of Naval Operations Admiral Vern] Clark to help get NPS off the BRAC list." He was referring to the Congressional Base Realignment and Closure study then underway to save money by eliminating unnecessary or redundant military installations across the country. Then-Acting Under Secretary of Defense (Acquisition, Technology, and Logistics) Michael W. Wynne's 4 January 2005 memorandum, "2005 Base Closure and Realignment Selection Criteria," identified the criteria by which to measure "Military Value." They were:

1. The current and future mission capabilities, and the impact on operational readiness of the total force of the Department of Defense, including the impact on joint war fighting, training, and readiness.
2. The availability and condition of land, facilities, and associated airspace.
3. The ability to accommodate contingency, mobilization, surge, and future total force requirements at both existing and potential receiving locations to support operations and training.
4. The cost of operations and the manpower implications.

Faculty and students from NPS' Physics Department recover autonomous gliders for environmental monitoring. (Naval Postgraduate School)

Other effects of base closure considerations also were cited, among them: the extent and timing of potential costs and savings; the economic impact of closure on existing communities in the vicinity; the ability of infrastructure of both the existing and potential receiving communities to support forces, missions, and personnel; and, the environmental impact. So, cost savings was only one consideration in deciding whether to close or realign an installation. This is where I focused my eventual "cost–benefit" analysis. As I would later write, "In the case of the Naval Postgraduate School, to make a closure decision primarily on cost considerations is to miss the very essence of what the school represents operationally, academically, and intrinsically to the Navy and to the Department of Defense."

Over the next several days, I did much research online and had many long-distance exchanges of information, data, and insights with the staff of then-NPS Provost Dr. Dick Elster in Monterey. As the analysis and narrative began to take shape, I briefed Admiral Mullen on the direction I was taking. He made a few adjustments and told me to proceed.

Two weeks later, I was again summoned to the admiral's office in Naples. He said, "Congratulations." Admiral Clark had used the paper to make a successful argument for Congress to remove NPS from the BRAC list. The arguments CNO Clark used 15 years ago are still valid and worth repeating.

What Remains the Same?

The 2005 Naval Postgraduate School White Paper was divided into several sections. Each one addressed a unique aspect of NPS that contributed to the school's "military value." The opening section, an overview, was preceded by, "The ability of our officer and enlisted leaders to anticipate and manage the challenges of tomorrow is only limited by our foresight today." The assertion made here, was that:

NPS may be one of our best tools to ensure the alignment of advanced operational concepts and technologies among the Department of Defense, Homeland Security, Inter-agency, and international military partnerships. Rather than considering closure of NPS, we should be focusing on how to better maximize the return on our investment. These rewards could well include our Navy's preeminence in educating and retaining the most technologically advanced war fighters in the world, both officer and enlisted, and our military's assured superiority in Joint and coalition warfare for generations to come.

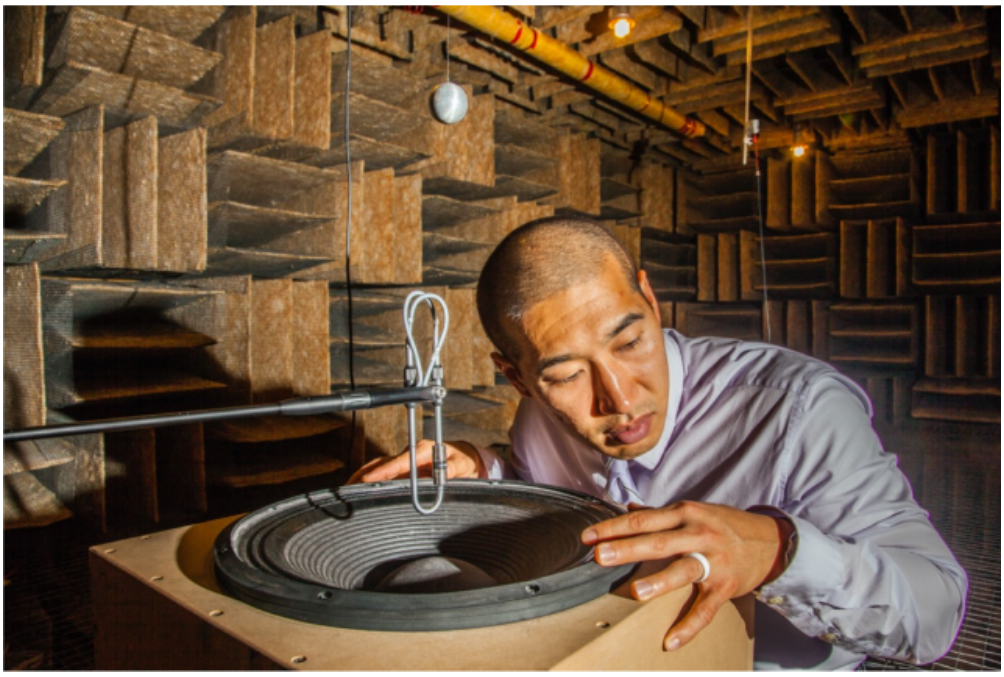
Fifteen years later, having conducted research and taught in both the Graduate School of Information and Operation Sciences and the Graduate School of Engineering and Applied Sciences, as well as in the Center for Homeland Defense and Security, and having served as advisor on many theses and Capstone research projects in each, I am convinced more than ever this remains true.

The next section of the 2005 White Paper started with *"We can't afford to build tomorrow what we have today!" This section focused on the establishment in 1951 of the Monterey, California, campus and relocation of the Naval Postgraduate School. At that time, the campus covered 135 acres along the Pacific Coast Highway and was purchased for $660,372 as part of a 627-acre buy. By 2005, the NPS holdings included 620.5 acres that originally cost $1.3 million. This included classrooms, research facilities, laboratories, ballistics and radar test facilities, UAV flight ranges, and ocean spaces. The school's proximity to other leading academic and research institutions—including Stanford University, UC Berkeley, UC Santa Cruz, the Defense Language*

Institute, and Lawrence Livermore Laboratory, as well as to Silicon Valley, the world's center of technological innovation—make its location unique. The current value of this real estate alone would be difficult to assess, and its intrinsic value in drawing talented faculty and students alike, while showcasing the American dream for our international students and partners, is incalculable.

"In attempting to compare apples to apples we miss the core differences."

This bad pun introduced the White Paper's most lengthy, data-driven, and perhaps most effective discussion. An August 2000 Proceedings article, "The Naval Postgraduate School: It's About Value," provided a comparative analysis of costs associated with a degree from NPS to a "similar degree" from a comparable, tier one civilian university. I went on to explain that, "… 'similar' though the degrees may be when displayed on a sheepskin, and surely just as challenging in their pursuit, a civilian course of study almost certainly does not represent the same tailored, defense-centric, militarily career-enhancing curriculum provided by NPS." This was followed by addressing a crucial flaw in any such cost comparison that failed to address the Educational Skills Requirements (ESRs) dictated by the Secretary of the Navy, the Joint Professional Military Education courses that enabled officers to satisfy both their master's degrees and their joint military education requirements while at NPS, nor the additional coursework required to ensure the student appreciates the military relevance of the academic material and can apply that knowledge immediately upon rejoining the operational force.



Navy Lieutenant Steve Yang, an undersea warfare student, researched the theoretically predictedacoustic radiation force on a body that is small compared to the wavelength of the sound. (NPS)

Another “core” difference between NPS and tier one graduate schools was the non-trivial issue of admission requirements. Many tier one universities require a minimum 3.0 undergraduate GPA, good scores on the Graduate Record Exam, and, usually, the accepted area of study for a master’s program must be in the student’s same or related field of undergraduate study. The White Paper admitted:

“The truth is that many NPS students would not gain entry into Tier One schools whose entrance criteria are not meant to consider the attributes of a combat warrior with proven leaderships skills, capable of managing complex weapons systems (a review by civilian universities of 300 Navy officers enrolled at NPS revealed they would admit only 12% directly and 13% with additional courses).”

Further, few if any tier one graduate schools would accept students with non-technical undergraduate degrees into technical master’s programs in the numbers the Navy required. I since have heard Admiral Mullen, a Distinguished Graduate of NPS in Operations Research, remark on multiple occasions that he probably would not have been accepted into another graduate program as a lieutenant! As a faculty member I can say with certainty that my students are every bit as capable and more. Students don’t

apply to NPS, they are *selected* based on their proven operational performance and leadership potential.

Before comparing the cost of a master's degree from NPS with a similar degree from a tier one university, it was necessary to explain the differences in academic years, total credit hours required in the two systems, and the average number of months required to complete a degree. Unlike most tier one universities working on a fixed academic calendar with new student enrollment limited to the fall only, the Naval Postgraduate School works on a quarter system and admits students into its broad array of curricula year-round. As stated in the 2005 White Paper,

"Bearing operational demands in mind, particularly during this time of war, this loss of scheduling flexibility would have a significant impact on the number of military students capable of accommodating such a restrictive admission policy."

Field Trip! Lieutenant Kristen Ainsley, U.S. Navy, an undersea warfare oceanography student, participated in ICEX 2020. Ainsley's research explores the acoustic dynamics of diffusive convection, often observed in the Arctic Ocean. (NPS)

But it was the “academic op tempo” at NPS, when compared with most civilian graduate schools, that drove the most significant differences in cost:

At NPS, the academic school year is based on four, twelve-week quarters consisting of 16 classroom hours per week. Although academic calendars vary at civilian universities, typically students attend classes 13 hours a week for 32 weeks of the year, and may attend a ten week summer term for seven hours a week. This amounts to approximately 58% more student-faculty contact hours per academic year at NPS than at a typical civilian university.

In other words, an NPS student could complete the 96 credit hours required to earn a degree in 18 months versus the 24 to 28 months that would probably be needed at a civilian university. That translates into six to ten months of additional tuition and a student’s salary to be covered by the government, while the servicemember attends classes rather than returning to an operational assignment. Even considering the costs associated with an NPS student who might need an additional 4.8 months on campus for transition and refresher courses, beyond the 18 months to earn the degree, the total tuition and salary costs would still be less at NPS. Furthermore, the NPS student would have completed JPME requirements for Joint Certification, a defense-related thesis, and would have met all educational skills requirements in under two years.

But there was another question that needed to be addressed: “How much would be saved by moving NPS to an existing military installation in a less expensive geographic area?” Keeping the same academic tempo in place, the cost of living and possibly operating costs would be lower. But this is where a purely fiscal analysis fails to consider the *intrinsic* value as a critical element in any cost benefit analysis.

Operationally and intrinsically, Naval Postgraduate School is a model environment for military academic excellence and a showcase of American values for international students. It should serve as an incentive for our best and brightest officers and enlisted personnel who seek graduate degrees to enrich and enhance their military careers and improve their post-career job prospects as well (in fact, many of these students should be encouraged to pursue defense-related employment upon retirement from the service, thereby bringing their extensive military experience and graduate education into government or private sector defense-related fields). NPS also imprints a strong positive impression of America and our military on international

students, many of whom will go on to be senior leaders, with considerable influence, in their own militaries. Fond memories of NPS and the friends with whom they studied there will pay further dividends on our investment through stronger collective security partnerships in the future.

Many of these intrinsic benefits are nonetheless tangible. The idyllic setting of NPS and its proximity to other prestigious universities and centers of innovation attracts research faculty from the finest universities in the nation. Would a less attractive and culturally rich environment leave the same favorable and lasting impression of America on international students and their families? And as for our U.S. students:

"The post graduate experience should be enriching both academically and socially. With the capital investment we have made in Monterey, California, we can offer the finest quality of life for our students and their families as an indication of our commitment to them and to their futures."

They deserve no less and they repay us with so much more.

NPS student Canadian Army Major Jason Dalziel investigates the quasi-static, dynamic, and fragmentation behavior of the M3 reactive material. International students are an

important part of the NPS educational experience and help build strong connections between the United States and its allies and partners. (NPS)

The White Paper summed up a final intrinsic comparison between distributing our students among various universities and keeping them at NPS as follows:

"While a civilian university might come close to equaling some of the intrinsic value associated with NPS, the vital operational aspects of the curriculum...would be missing. Professors would generally not have the extensive defense-related experience common among the NPS faculty, nor could they be expected to demonstrate military applications of their subject matter. Student/faculty contact hours would be less . . . since civilian universities routinely use graduate assistants to teach some graduate level courses, and university research would not be 85% defense related as it is at NPS. The academic environment, while perhaps representing a refreshing change for military students, would tend to take minds away from the challenging operational applications of their course of study. In fact, the opportunity to work with other service members and with international military students would be largely lost. As would the ability to introduce foreign officers to a challenging and enriching glimpse of what their military futures could hold. The return on investment in sending military students to civilian universities . . . would be far less than it is...at NPS."

The next section of the 2005 White Paper was introduced as follows:

"If our task was to design a graduate university to prepare America's young military leaders for the dynamic challenges and opportunities of a vastly different tomorrow it would be joint and international, have diverse defense and inter-agency related curricula, be held to the highest academic standards, taught by professors experienced in advanced military research. It would be cost effective and offer the highest level quality of service needed to draw and keep our best…"

NPS is this and more. The White Paper provided data, details, and examples to illustrate the joint, interagency and national security, international, naval, and transformational nature of the student body, the vast spectrum of curricula, and contributions made by students and faculty research in a time of war.

"Naval Postgraduate School is ideally placed to serve as the centerpiece of a Navy Education Strategy that takes a total force, lifelong approach to serving our Navy family and our nation's defense needs."

NPS was subsequently removed from the BRAC list in 2005.

The U.S. military involvement in ground wars in South Asia has greatly diminished, but the threat to U.S. interests and security from peer competitors is on the rise. This was clearly enunciated in the most recent National Defense Strategy that also referred to an erosion of our military advantage, both of which are being addressed through an increase in defense spending. The national debt has gone from $7.3 trillion (61 percent of GDP) in 2005 to $26.5 trillion at the end of Q2 2020 (136 percent of GDP). Most recently, a global pandemic has had a dramatic strategic impact on economies and cultural interactions. We have adjusted to new norms of work and are reconsidering the viability of mega cities as well as vulnerabilities in global interdependencies.

Key enabling (or disruptive, depending on who controls them) technologies continue to emerge, contributing to the increasing complexity of today's strategic environment. These include, but are not limited to:

- AI and Robotics—The development of both specific and general AI will dramatically change warfare (outpacing human cognition and reaction/decision time).
- 5G LTE, IoT—Ubiquitous cyber capabilities will increase anonymity and vulnerability.
- Nano technology, molecular build, additive manufacturing—Will revolutionize logistics, energy, battlefield medicine, others.
- Quantum Encryption, Communication, and Computing—Could ensure reliable cyber security and much greater communications and computing power.
- Energy Sources and Uses—Renewable sources of energy will be integrated with traditional power sources and will affect weapons, propulsion, resupply/recharge, dwell time.

Many aspects of warfare today are vastly more advanced than in 2005, including:

- Complex, Adaptive Combat Systems of Systems—Leveraging artificial intelligence for anticipatory, emergent, self-organizing, and adaptive behavior to changes in the operational environment. This will be necessary for logistics networks, counter swarm capabilities, layered defensive systems, manned and unmanned weapon and sensor integration.

- Hypersonic Weapons—The greatest challenge may be in developing a C4Iinfrastructure capable of responding without humans in the loop.
- Interconnected Economic and Military Power—Control of vital resources to include minerals, rare earth elements, water, etc; market access, currency valuation, sanctions, and trade wars.
- Ability for Population Centers to be Taken Off the Grid—Entire populations, infrastructures, or economic sectors may be held hostage forcing governments to capitulate.
- Increased Hybrid / Cyber Warfare—To generate havoc, mistrust, plausible deniability.
- Weaponization of Space—More nations now have the ability to place satellites in orbit for military purposes.
- Hybrid or Localized Conflict—Battle zones may increasingly feature littorals, choke points, disputed islands, and EEZs. Bastion Defenses linked to the control of critical resources and SLOC access, including the South China Sea and the High North.

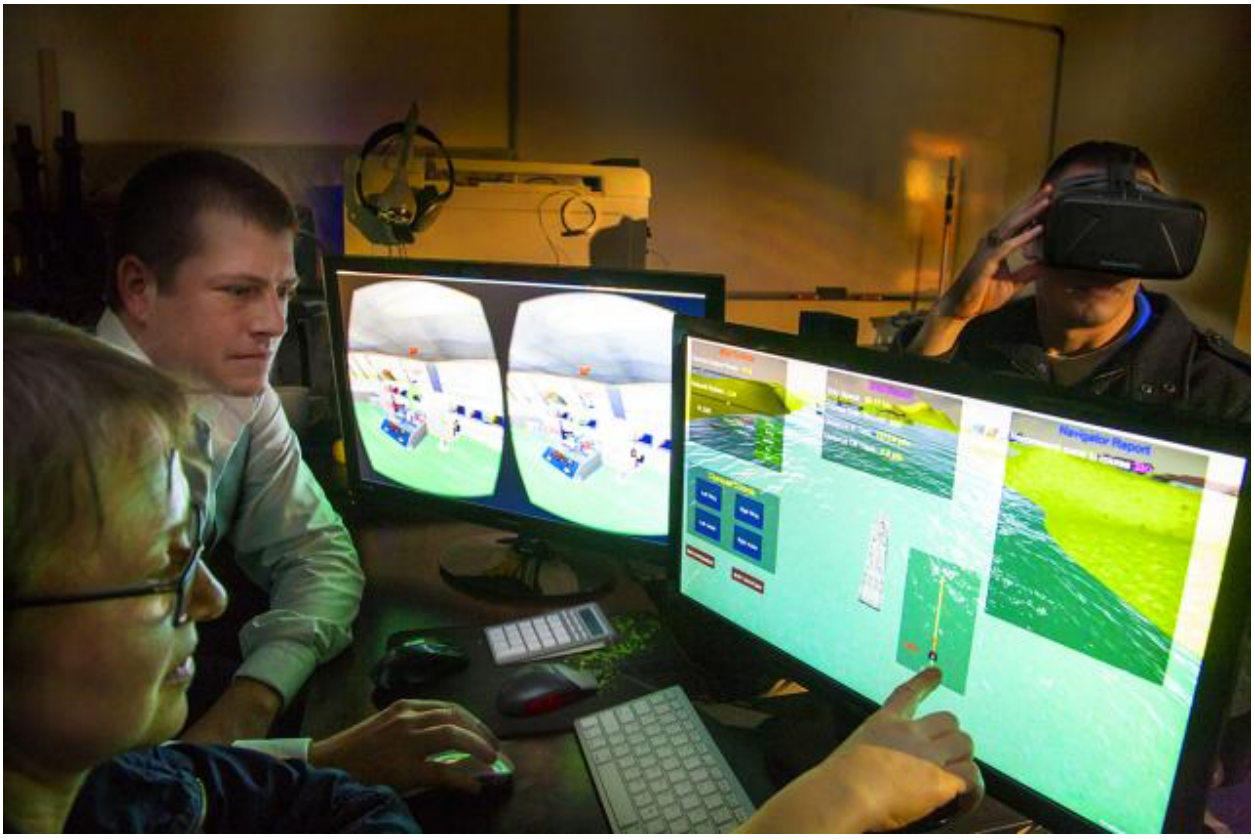
Civilian and uniformed leaders have turned over at all levels many times since 2005. This has had an impact on NPS, and under the guidance of President Ann Rondeau, the school has demonstrated great flexibility in shifting focus to the new strategic environment through innovation, increased partnerships with industry and academia, and in helping to define the military's role in great power competition. The school's revised mission statement succinctly asserts:

The Naval Postgraduate School provides defense-focused graduate education, including classified studies and interdisciplinary research, to advance the operational effectiveness, technological leadership and warfighting advantage of the Naval service.

To accomplish this mission, NPS today provides more than 70 STEM-based curricula, and more than150 labs and all-domain test ranges to enable experimentation, as well as a secure environment to conduct classified research and education. As a new member of the Naval Research and Development Enterprise (NR&DE), the school partners with Department of the Navy Warfare Centers, Naval Research Laboratory, and the Office of Naval Research. Each quarter it pairs students familiar with the most current operational experience and ideas with sponsors and faculty supporting ONR's S&T portfolio, conducting more than $100m in sponsored research aligned to the curricula and focused on national security. Annually, this results in more than 1,000 research theses and Capstone reports published every year, and between 15 to 20 patents. And unlike most civilian universities and research

facilities, there are no Chinese or Russian nationals taught at NPS, all but eliminating the export of our work to the nation's two greatest adversaries.

NPS is fully recognized as a *research* and education institution with faculty and students working on cutting-edge technologies, analyses, and wargaming. The NavalX Tech bridge at NPS leverages proximity to Silicon Valley and is connected directly to the NR&DE. This covers the spectrum from cyber security to artificial intelligence and machine learning to space sciences and robotics to systems engineering, operations research, combat logistics, national security studies, and the broad spectrum of natural and soft sciences as they apply to warfighting and combat effectiveness. NPS has just inaugurated the Wayne P. Hughes Naval Warfare Sciences Institute under the direction of Professor of Practice Jeff Kline, Captain, U.S. Navy (Retired), to coordinate educational and research responses to fleet and other defense sponsors. This includes an ongoing warfare innovation continuum focused on anticipating warfighting requirements and tactics.



As part of his thesis at NPS, Navy Lieutenant Brendan Geoghegan built a next-generation virtual reality software program in which players or test subjects can immerse themselves as a conning officer on the bridge of a Navy ship. (NPS)

The strategic environment, enabling technologies, and the culture of education have dramatically changed in the past 15 years. The Naval Postgraduate School has not only kept pace but has demonstrated the ability to anticipate and adapt to these changes. This continues to be accomplished through joint, interagency, international, uniformed, and civilian participation on campus and through distance learning, at the master's and doctoral levels. Undeterred by the pandemic, NPS has largely shifted to distance learning and remote access using the school's flexible ".edu" servers and resources. While efficient, distance learning cannot replicate the high quality in-resident student-learning experience I described, nor can it replace the value of learning-by-doing through applied research that every master's student must complete to graduate.

Chief of Naval Operations (CNO) Admiral Mike Gilday visited NPS on 17 December 2020 and declared, "NPS is the Navy's applied research university. There are functions that occur here that [the Navy] can't get anywhere else in the world. The surplus of experience and knowledge partnered with the ability to work on classified material on a secure campus makes NPS an invaluable asset to the fleet."

NPS is not a cost to minimize, it is a capability to optimize. The strategic environment, enabling technologies, and the culture of education have dramatically changed in the past 15 years. NPS has not only kept pace but has demonstrated the ability to anticipate and adapt to these changes. This continues to be accomplished through joint, interagency, international, uniformed, and civilian participation on campus and through distance learning, at the master's and doctoral levels. NPS provides relevant solutions and graduates warrior-leaders prepared for the contemporary battlespace. They are the "weapon system" we deliver.

Now, more than ever, we must leverage the defense-focused research and graduate education uniquely catalyzed at NPS to deliver capabilities for warfighting advantage: technologically and intellectually. Important then, critical today, NPS is unlike any other graduate institution in the country: *responsive, interdisciplinary, applied, innovative, classified,* and *secure*.

Diverse by design: Students in Dr. Porter's Defense Analysis and Systems Engineering courses include officers and enlisted professionals from the U.S. military and allied and partner nations. In this class, students from the U.S. Navy, Air Force, and Army, and the Hungarian Army and Indonesian Navy apply what they learn--including from each other--to warfighting problems. (NPS)

Dr. Wayne Porter, Captain, U.S. Navy (Retired)

Dr. Porter is a Senior Lecturer in the Defense Analysis and Systems Engineering Departments of the Naval Postgraduate School, where he also serves as Co-Director of the CORE Lab and Director of the Littoral Operations Center. He holds a Ph.D in Information Sciences and two Masters of Science degrees – in Computer Science and Joint C4I Systems Technology - from the Naval Postgraduate School. His military career included duty in Japan, England, Italy, the Balkans, and Bahrain where he was the Fifth Fleet Assistant Chief of Staff for Intelligence and Maritime Operations Center Deputy Director of Operations. He also served three tours on the personal staff of Admiral Mike Mullen, including as Special Assistant for Strategy when Mullen was the Chief of Naval Operations and Chairman of the Joint Chiefs.

MORE STORIES FROM THIS AUTHOR

VIEW BIOGRAPHY